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EPA Releases New Air Quality Modeling System

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Research Triangle Park, NC.....A new air quality modeling system, developed by the U.S.

Environmental Protection Agency's National Exposure Research Laboratory in Research Triangle

Park, NC, is being released to the public on June 30, 1998.

The computer-based modeling system will enable air quality managers and scientists to simulate an atmosphere with various mixes of pollutants like ozone, acid rain or fine particles formed from emissions by automobiles and industry. With several key strokes, the user can simulate weather conditions and patterns to see how pollutants are affected or watch how pollutants are transported from one state to another across the region, using three-dimensional visualization capabilities.

Called Models-3, the new generation of modeling software has been under development for seven years at the EPA and will be made available without charge for use by the federal government, states, industry and academia to address regional and multi-pollutant air quality concerns.

The new software system has many new features that make it faster, more flexible and easier to use. "Many regulators and scientists have been waiting for this air quality modeling system with much anticipation," said Frank Schiermeier, Director of the laboratory's Atmospheric Modeling Division. "The system offers many capabilities that will help environmental managers find solutions to today's complex environmental problems," he said.

"Last year, EPA set new air quality standards for ground-level ozone and particulate matter to protect the American public," said John S. Seitz, Director of EPA's Office of Air Quality Planning & Standards in Durham, NC. "We anticipate Models-3 will be a key tool that states will use to demonstrate how best to achieve attainment of the new standards," he said.

First generation air quality models gave only simple estimates of a particular air pollutant within one small geographical area such as a city. Second generation models provide more reliable air quality predictions focused on larger geographical areas. Models-3 is a third generation modeling system that

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can handle multiple pollutants simultaneously and show their movement across regions or

subcontinents. "Without large scale models you can't get a complete picture of the nature of the problem or the extent of a regional strategy to deal with the problem," said Joan Novak, Models-3 Project Manager.

Models-3 has a unique framework design with a "plug and play" feature that allows scientists and regulators to build their own modeling system to suit their needs. Users can access the pre-installed Community Multiscale Air Quality (CMAQ) modeling system developed by EPA or "plug in" their own modeling components to work with the existing Models-3 software, said Daewon Byun, CMAQ Science Team Leader.

The Models-3 framework makes it possible to easily upgrade air quality modeling systems and put advanced applications more quickly into the hands of air regulators and decision makers. "Users can unplug the obsolete or ineffective models and plug in new ones rather than replace the entire system they are familiar with," Novak explained.

Models-3 also promises to help speed advances in air quality modeling -- the science of developing a mathematical simulation of physical and chemical processes that govern the movement**,** transformation and deposition of air pollutants**.** "Scientists can focus on their speciality rather than first having to set up their own modeling system," Novak said. "Atmospheric science can progress more rapidly and scientists will be able to share data and information more easily with the use of Models-3," she said.

The system is expected to be used extensively by environmental managers in state and national governments to develop strategies to control ozone and other pollutants, and by scientists who develop air quality modeling systems. The user-friendly system will run on computer systems, from powerful workstations to supercomputers.

Models-3 has undergone rigorous testing and external peer review. A prototype of Models-3 developed by MCNC's North Carolina Supercomputing Center, under a cooperative agreement with EPA, has been in use for a few years. In addition, the EPA's Models-3 has been tested over the past year by several state government regulators, universities and the Canadian government.

Novak is already looking at ways to expand Models-3 capabilities. The goal is to use Models-3 to develop a multimedia modeling system that will be able to track a pollutant's entire path from its source, as it travels through the air, water and land, to its final destination.

"We will have a multimedia system that takes a pollutant all the way through the ecosystem to its end point," Novak explained.

EPA is developing an instructional manual for Models-3 that will be made available to users. For more information on Models-3 or to access a tutorial on Models-3 visualization tools, visit EPA's Models-3 web page at www.epa.gov/asmdnerl/models3/.

NOTE TO EDITOR: Models-3 color photographs and beta videotape of a computer simulation are available by contacting Ann Brown, EPA Public Affairs, 919-541-7818.

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